

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : **10/597796**
Applicant : Cristina
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Title : Shower Head
TC/A.U. : 3752
Examiner : **Jonaitis**
Docket No. : **5868**
Customer No. : 26936

Commissioner for Patents
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AMENDMENT

Sir:

Please amend this application as follows:

Amendments to the Claims:

1. (currently amended) A shower head comprising

a dispensing plate provided with at least one hole for dispensing water,
a closing plate, in fluid connection with a water outlet, wherein said plates directly face each other relative to an axial direction and the shower head comprises a seal directly arranged and pinched in compression between said dispensing and closing plates, so as to sealingly delimit with the plates a collecting chamber in order to dispense the fluid through the holes of the dispensing plate,

a closing ring arranged between said dispensing and distribution plates, the closing ring being arranged coaxially with said seal, and having an axial thickness smaller than the axial thickness of the seal when at rest,

wherein said closing ring is shaped complementary relative to the seal so that in a deformed configuration, following the axial compression exerted by the plates, the seal expands radially into contact with an internal wall of the closing ring, which faces towards the collecting chamber, and

the closing ring is substantially stiff in the axial direction so as to form an end of stroke as the plates approach one another during the assembly step of the shower head and so as to ensure a minimum thickness of the collecting chamber for the water flow towards the dispensing holes.

2 - 3. (canceled)

4. (previously presented) A shower head according to claim 1, wherein said dispensing and distribution plates, in an assembled configuration, define a collecting chamber having a decreasing axial thickness between a central portion and a peripheral portion relative to a radial direction.

5. (canceled)

6. (original) A shower head according to claim 1, comprising nozzles suitable for being partly inserted in the holes of the dispensing plate.
7. (previously presented) A shower head according to claim 6, wherein said nozzles comprise a dispensing portion projecting from the dispensing plate and a stopping portion suitable for forming a stop during introduction of the nozzles into the relevant holes.
8. (original) A shower head according to claim 7, wherein an axial thickness of said stopping portion is smaller than the thickness of said closing ring.
9. (original) A shower head according to claim 1, wherein said seal is made integral with a membrane provided with said nozzles.
10. (original) A shower head according to claim 9, wherein the axial thickness of the membrane is smaller than the axial thickness of the seal integral with membrane, so that in the operation for closing plates, seal is subject to compression by the same.
11. (currently amended) A shower head according to claim 9 further comprising a closing ring mounted coaxially to the seal, ~~a closing ring is mounted~~.
12. (previously presented) A shower head according to claim 11, wherein the axial thickness of the membrane is smaller than the axial thickness of the closing ring and of the seal, so that in the operation for closing the plates, the seal is subject to compression by the plates.
13. (original) A shower head according to claim 1, wherein said seal is made of a silicone rubber.

14. (previously presented) A shower head according to claim 1, wherein said dispensing and distribution plates are axially held together in compression by screw connecting means.

15. (previously presented) A shower head according to claim 14, wherein said screw connecting means comprise a screw passing through connecting holes obtained on the plates, and provided with a head abutting one of said plates, said screw being locked on an end opposite the head, on the side of the other plate by a nut.

16. (original) A shower head according to claim 14, wherein said screw connecting means are arranged on a peripheral portion of said plates radially external to the collecting chamber.

17. (original) A shower head according to claim 14, wherein said screw connecting means pass through fixing holes of said closing ring so as to lock said closing ring into position relative to the plates.

18. (previously presented) A shower head according to claim 1, wherein said dispensing and distribution plates, at faces directly facing each another, are substantially planar.

19. (original) A shower head according to claim 1, wherein said dispensing and distribution plates, at faces directly facing each another, are concave or convex.

Remarks/Arguments:

This is a reply to the office action of June 22.

The objection to the drawing is understood to apply to claim 4. The decreasing axial thickness feature is described at paragraph [0021] of the specification; however, it is not shown in the drawings. The examiner is requested to advise whether a drawing like Fig. 5, but showing a decreasing axial thickness would be entered. If so, an opportunity to present a new figure will be appreciated. If not, the examiner is authorized to cancel claim 4 by examiner's amendment. In our view, it would not be new matter to insert a figure showing the decreasing axial thickness, which is well described in the original application at paragraphs [0021] and [0042], and original claim 4.

The cancellation of claim 5 moots a rejection under 35 USC 112. The amendment to claim 11 removes the redundancy noted by the examiner.

Claim 1 has been amended to include the subject matter of claims 2, 3 and 5, which have been canceled. Claim 1 is a new combination not previously presented, inasmuch as claim 5 originally depended from claim 1. Claim 5 was rejected as anticipated by Thomas et al., while claims 2 and 3 were rejected as obvious over Thomas. We believe the new combination of claim 5 is patentable over Thomas et al. for reasons set out below.

The main goal of the present invention is to produce very thin shower heads, which nevertheless are water tight..

According to this invention, the dispensing plate and the closing plate are directly assembled by interposing a seal between them. In this way, the overall axial thickness

of the shower head is kept very low. However, there is the problem of ensuring water tightness in a shower head in which the axial force exerted by water pressure on the plates may reach more than a hundred kilograms (220 lb.), if the shower head diameter is large. Therefore, it is necessary to ensure water tightness by introducing a closing ring which is shaped complementary relative to the seal and has an axial thickness smaller than the axial rest thickness of the seal.

In this way, during assembly of the plates, the seal deforms in a controlled way, expanding radially outward and bearing against the internal wall of the closing ring. In order to control the deformation of the seal (so as to provide water tightness), the axial thickness of the seal is made greater than that of the closing ring, and the closing ring is stiff in the axial direction.

This seal construction ensures water tightness, while the ring provides radial compression of the seal, a stop in the approach between the plates, and a radial shield for the seal itself.

We submit that Thomas does not have the combination of features recited in claim 1, and would not have rendered that combination obvious. In particular, there does not appear to be any contact or interaction between the peripheral ring 102 of Thomas and his resilient sealing members. Fig. 16 of Thomas illustrates this point. Compare Fig. 5 of the present application (which is described at paragraph [0019]). Thomas, therefore, does not disclose that “said closing ring is shaped complementary relative to the seal so that in a deformed configuration, following the axial compression exerted by the plates, the seal expands radially into contact with an internal wall of the closing ring... .”

We believe that claim 1 as amended is patentable over the prior art of record, and the dependent claims are deemed allowable for the features they inherit from claim 1, in combination with the additional features recited.

The examiner is invited to telephone the undersigned if any issue might be resolved by an interview.

Respectfully submitted,

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